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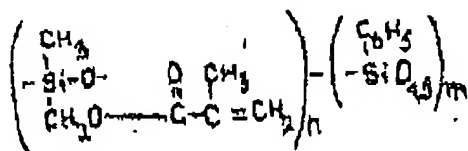
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PHOTOPOLYMER PRINTING FORME

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The present invention relates to photopolymer printing formes used in the printing industry.

The well-known photopolymer printing forme consists of an aluminium support and a photopolymerizing layer, comprising an oligoacrylate ester, an unsaturated organosilicon oligomer with the formula I



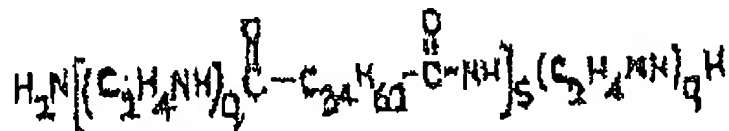
(where $n = 1-2$ and $m = 1-3$), benzoin, a thermoinitiator (benzoyl peroxide) and Bordeaux C dye [see ref. 1].

It is sometimes necessary in printing to fix the photopolymer printing forme to a magnetic forme cylinder (image forme). However, the conventional printing forme has an aluminium support, which does not have any magnetic properties, so it is difficult to fix it to such a forme cylinder. The application of the photopolymerizing layer of this forme to a steel support, which does have magnetic properties, does not give favourable results, because the photopolymerizing layer does not adhere satisfactorily to steel.

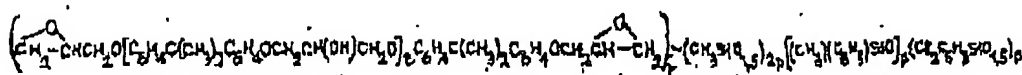
The aim of the present invention is therefore to simplify the attachment of the photopolymer printing forme to the forme cylinder and improve the adhesion of the photopolymerizing layer to the support.

The aim of the invention is achieved in the following way. The support of the printing forme is made of steel, and the photopolymerizing layer, which comprises an oligoacrylate

ester, an unsaturated organosilicon oligomer with the formula I, benzoin, and dicoumyl peroxide as a thermoinitiator, also contains a hardener in the form of a liquid polyamide resin with formula II



(where q = 3-4 and s = 2-3), and an epoxidized organosilicon resin with formula III



(where p = 2-3, r = 5-6 and t = 1-2), the quantities of these constituents being as follows (expressed in parts by weight):

Oligoacrylate ester	100
Organosilicon oligomer of formula I	80-95
Liquid polyamide resin of formula II	0.8-2
Epoxidized organosilicon resin of formula III	1-3
Dicoumyl peroxide	0.2-2
Benzoin	0.5-1.5.

Bordeaux C dye can also be included in the photopolymerizing layer in an amount of 0.01-0.03 parts by weight in order to

confer a color on the photopolymer forme.

The printing forme obtained according to the invention has a high physical and mechanical strength and can be used as a hot embossing block fixed to the magnetic plate cylinder.

Example 1

A composition was prepared from 100 wt-% of an oligoacrylate ester by adding 80 wt-% of the organosilicon oligomer of formula I, 0.8 wt-% of the liquid polyamide resin of formula II, 1 wt-% of the epoxidized organosilicon resin of formula III, 0.2 wt-% of dicoumyl peroxide and 0.5 wt-% of benzoin, after which these constituents were mixed at 20°C until a homogeneous solution was obtained.

The printing forme was prepared as follows. The color-sensitive liquid composition obtained above was poured into the cavity of a forming and printing frame made of a steel plate, a small type-high frame and a glass with the negative affixed to it. LUF-80 lamps were used to expose the composition for 30-40 minutes from the side of the negative. After the exposure, the blank of the printing forme was washed with a mixture of acetone and alcohol, and the forme with its support was subjected to thermal treatment, using the following regimes: heating for 2 hours at 20-120°C, for 3 hours at 120-130°C, for 2 hours at 130-150°C and for 2 hours

at 150-180°C. The constituents of the composition used and the physical and mechanical properties of the printing forme obtained are shown in the following table.

Composition No.	Ingredients of the composition, in parts by weight								Shore hardness, in Shore hardness	Thermal stability, °C	Compressive strength, kg/cm ²	Specific impact strength, kg.cm/cm ²	Peeling resistance ¹	Residual deformation after compression, %
	OAE	OSO	LPR	EOR	DCP	BP	B	BD						
1	100	80	0.8	1	0.2	-	0.5	-	100	200	401	85	4.1	3.1
2	100	90	1.5	2	1.0	-	1.0	0.01	100	200	402	86	4.0	3.0
3	100	95	2.0	3	2.0	-	1.5	0.03	100	200	400	84	4.0	3.1
Prior art	100	90	-	-	-	1.5	1.0	0.01	100	200	401	85	0.6	3.0

¹ Resistance of the relief picture to peeling from a steel spoon, kg/cm²

OAE = Oligoacrylate ester

OSO = Organosilicon oligomer of formula I

LPR = Liquid polyamide resin of formula II

EOR = Epoxidized organosilicon resin of formula III

DCP = Dicoumyl peroxide

BP = Benzoyl peroxide

B = Benzoin

BD = Bordeaux C dye

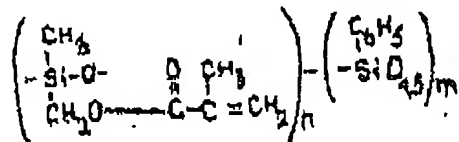
Examples 2 and 3

The method described in Example 1 was used to prepare two compositions and two printing formes, made from them. The ingredients used are shown in the same table, together with those of the composition known from the prior art. The table also gives the corresponding properties of the printing formes obtained with them.

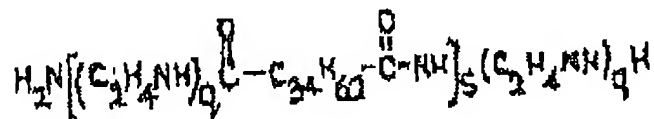
The data listed in the table show that the photopolymer printing forme according to the invention has good physical and mechanical properties and its photopolymerizing layer has a considerably better adhesion to the steel support, so it can be used as a hot embossing plate fixed to a magnetic forme cylinder.

Claims

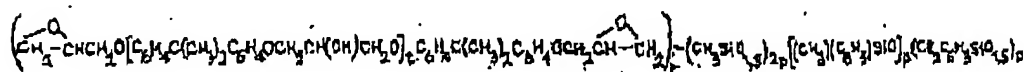
1. Photopolymer printing forme that consists of a support and a photopolymerizing layer comprising an oligoacrylate ester, an unsaturated organosilicon oligomer with formula I



(where $n = 1-2$ and $m = 1-3$), as well as benzoin and a thermoinitiator, characterized in that, in order to simplify the fixing of the photopolymer printing forme to a forme cylinder, the support of the forme is made of steel, and the photopolymerizing layer contains dicoumyl peroxide as the thermoinitiator, and additionally contains a hardener in the form of a liquid polyamide resin with the general formula II



(where $q = 3-4$ and $r = 2-3$), and an epoxidized organosilicon resin with the general formula III



(where $p = 2-3$, $r = 5-6$ and $t = 1-2$), the various constituents being used in the following amounts, expressed in parts by weight:

Oligoacrylate ester	100
Organosilicon oligomer of formula I	80-95
Liquid polyamide resin of formula II	0.8-2
Epoxidized organosilicon resin of formula III	1-3
Dicoumyl peroxide	0.2-2
Benzoin	0.5-1.5.

2. Forme according to Claim 1, characterized in that, in order to obtain a coloured printing form, the photopolymerizing layer additionally contains a Bordeaux C dye in an amount of 0.01-0.03 wt-%.

Publication taken into consideration

1. Soviet Patent granted for Application No. 2,560,838/23-04 of 27 December 1977, with International Classification C 03 C 1/68 (closest prior art).